

REMARKS

Drawings

The Office Action indicates that color drawings are acceptable only upon petition. Upon issuance of a Notice of Allowance, Applicants will file formal drawings in black and white.

Method Claims

Method claims 1-14 and 16 were rejected as anticipated by Chattoraj or Zieher, or as obvious in view of Chattoraj or Zieher combined with Sivakumar.

Chattoraj or Zieher each teach systems used in liquid streams. Chattoraj adds fluorescent dyes to water systems to test and monitor biological populations. Zieher adds fluorescent tracers and agents to liquid streams to monitor and control membrane separation processes. Sivakumar teaches a tracer that interacts with a material being monitored.

Applicants have amended independent claims 1 and 10 to distinguish claims 1-14 and 16 from the cited references. Applicants' method as now claimed is a method for characterizing or detecting a contaminant in a fluid flow system in which gaseous tracers are used in a system that is not completely filled with liquid.

Chattoraj, Zieher, and Sivakumar all relate to testing in liquid systems, where the fluorescent tracer or agent is added to the liquid stream. In contrast, Applicants' method as now claimed uses gases. In a flow system that is not filled with liquid, this has the important advantage that the gaseous tracers can easily navigate bends or other irregularities in the flow system, and sample the entire surfaces of the pipes or ducts of the system. The cited references do not teach or suggest the gaseous tracer system of the present invention. Therefore, Applicants believe independent claims 1 and 10 as amended are now in condition for allowance, as are the claims that depend directly or indirectly on claims 1 and 10.

New Method Claims

Claims 21-77 have been added. Claims 21-32, 42-47, and 71-77 depend indirectly or indirectly on independent claims 1 or 10, and are believed to be allowable for the reasons discussed above. Claims 33-41 and 48-70 depend on allowed independent claim 15, and are believed to be allowable as they add further limitations to an allowed claim.

Apparatus Claims

Independent apparatus claim 17 was rejected as anticipated by Chattoraj and Zieher. Dependent apparatus claims 18-20 were rejected as obvious in view of either Chattoraj or Zieher combined with Chapman. Chattoraj and Zieher are discussed above with reference to the method claims. Chapman discloses a leak detection system in which a tracer is injected into a liquid in which the tracer is soluble. If the liquid storage system leaks, the tracer migrates to a sampling device outside the storage system. When the tracer is detected at the sampling device, leakage in the storage system is identified.

Claim 17 has been amended to distinguish the present invention from the cited art. The present system uses a gaseous tracer, as does Chapman. However, Chapman simply monitors for the tracer at remote sampling devices outside the storage system. The present invention inserts a known volume of tracer and advects the tracer through the system at a known rate. This enables the present system to identify, locate, and measure contaminants in a flow system. Chattoraj and Zieher allow quantification of contaminants, but do not locate the contaminant source. Thus, claim 17 as amended provides an apparatus that can locate contamination source. This is not taught or suggested by a combination of either Chatteraj or Zieher with Chapman. Therefore,

Applicants believe independent claim 17, and dependent claims 18-20, are in condition for allowance.

CONCLUSION

Applicants believe the claims as amended distinguish over the cited art and are in condition for allowance. If any further questions should arise prior to a Notice of Allowance, the Examiner is invited to contact the attorney at the number set forth below.

Respectfully submitted



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Date: November 12, 2004

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CERTIFICATE OF MAILING

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